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TECHNICAL ENFORCEMENT SUPPORT AT HAZARDOUS WASTE SITES

U.S. EPA CONTRACT NO. 68-01-7331

CDM Federal Programs Corporation

CDM Federal Programs Corporation

July 20, 1987

Hans Waetjen
Project Officer
U.S. Environmental Protection Agency
401 M Street, Room 2834
Washington, D.C. 20460

PROJECT: EPA CONTRACT NO.: 68-01-7331

DOCUMENT NO.: T455-C02-EP-AWHZ-1

SUBJECT: Draft Report for Work Assignment 455
Review Comments on the Endangerment
Assessment For the Asbestos Dump Site
Morris County, N.J.

Dear Mr. Waetjen:

Please find enclosed the draft report entitled, "Review Comments on the Endangerment Assessment for the Asbestos Dump Site, Morris County, NJ" (document control no. T455-C02-DR-AUZZ-3) as partial fulfillment of the reporting requirements for this work assignment.

If you have any comments regarding this submittal, please contact Andrea Myslicki of Labat-Anderson Incorporated at (703) 525-9400 by July 31, 1987.

Sincerely,

CDM Federal Programs Corporation

Harry P. Butler
Deputy Program Manager

TEM:srw

Enclosure

cc: ~~Nigel Robinson~~, EPA Primary Contact, CERCLA Region II
Cathy Moyik, EPA Regional Contact, CERCLA Region II
Glenn Hardcastle, EPA HQ Coordinator, CERCLA Region II
Robert Goltz, CDM Federal Programs Corporation (letter only)
Bruce Bakaysa (letter only)
Andrea Myslicki, Labat-Anderson Incorporated, Project Manager
(letter only)

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TAK2/59

DRAFT REPORT
REVIEW COMMENTS ON THE
ENDANGERMENT ASSESSMENT
FOR THE
ASBESTOS DUMP SITE
MORRIS COUNTY, NJ

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Waste Programs Enforcement
Washington, D.C. 20460

Work Assignment No.	:	455
EPA Region	:	II
Site No.	:	2PA2
Date Prepared	:	July 20, 1987
Contract No.	:	68-01-7331
CDM Federal Programs		
Corporation Document No.	:	T455-C02-DR-AUZZ-3
Prepared By	:	Labat-Anderson Incorporated
Work Assignment Project Manager	:	Andrea Myslicki
Telephone Number	:	(703) 525-9400
Primary Contact	:	Nigel Robinson
Telephone Number	:	(212) 264-8674

TAK2/59

ASB 002 0773

LABAT-ANDERSON COMMENTS ON THE DRAFT REMEDIAL INVESTIGATION REPORT FOR ASBESTOS DISPOSAL SITES IN MORRIS COUNTY, NEW JERSEY

LABAT-ANDERSON Incorporated has three major concerns with the Draft Remedial Investigation Report (RI) for the asbestos disposal sites in Morris County, New Jersey. The RI does not quantify the potential for the migration of asbestos in either the airborne or rainfall run-off pathways, and the RI does not include a toxicological analysis for the indicator chemicals at the sites. The following comments explain in detail these deficiencies in the RI.

1. POTENTIAL AIRBORNE ASBESTOS FROM WIND EROSION OF THE DISPOSAL SITES

The RI discusses the presence of loose asbestos bearing materials (eg: shingles, siding, coating chips) in various quantities at the subject disposal sites. The RI concludes that this condition presents a potential for human exposure via the direct contact and fugitive dust/wind erosion mechanisms. However, the RI does not do any modeling of these pathways to determine whether they actually do present a significant exposure potential. The RI defends this conclusion on the results of airborne asbestos monitoring performed at the time of RI site work. The results of this monitoring showed that the level of activity associated with the RI site work did not result in the release of airborne asbestos in excess of any airborne asbestos threshold quantities. However, LABAT-ANDERSON considers that this monitoring is not necessarily representative of conditions that could lead to significant production of airborne asbestos.

The local meteorological conditions present during the air sampling would have limited the production of airborne asbestos. For example, the average wind speed for these samples was less than five miles per hour and the average humidity was approximately seventy percent. Furthermore, some samples were taken during or soon after a rainstorm. These conditions, although perhaps typical for these site

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locations, are somewhat limiting for airborne asbestos production. This is especially the case for the White Bridge Road Site since it has the potential for fugitive dust generation by the riding horses in the vicinity of the landfill areas.

LABAT-ANDERSON Incorporated considers that it is appropriate to model release(s) of airborne asbestos at the disposal sites that are normally inhabited. This modeling will support the determination of whether further, long term airborne asbestos monitoring is appropriate and it will help quantify the health risk to the individuals on site. Furthermore, this modeling would be consistent with guidance provided for Endangerment Assessment (EA) preparation and similar modeling done for other exposure pathways in the RI.

Preliminary results of modeling performed by LABAT-ANDERSON indicates that there is a potential for individuals that reside on or near the sites to receive some long term exposure to low levels of airborne asbestos. The predicted levels, given conservative assumptions, are expected to result in airborne asbestos concentrations commensurate with the occupational limit prescribed by the Occupational Safety and Health Administration for asbestos workers. Further site information such as vegetation cover, soil particle size distribution, and percent asbestos content in the topsoil would allow a more refined estimate.

The details of the preliminary analysis performed are discussed in Appendix A of this report. LABAT-ANDERSON Incorporated will perform revised modeling after a site visit is completed and revised estimates for the previously mentioned variables are available. Any conclusions/recommendations will be included in a supplemental response to this report.

2. INSUFFICIENT TOXICOLOGICAL DISCUSSION OF HEALTH EFFECTS

The EA portion of the RI does not identify or quantify the potential health risks associated with the predicted concentrations of contaminants at exposure points. The EA states repeatedly that toxicity data was not available or was incomplete for most of the chemicals on site. Based on a review of readily available references LABAT-ANDERSON Incorporated considers that sufficient toxicological information is available for most of the chemicals of interest at these sites.

Therefore, consistent with guidance on EA preparation, LABAT-ANDERSON Incorporated considers that it is appropriate to provide a health risk/effect estimate for the predicted chemical exposure. It is recognized that this estimate may not be complete for all of the selected chemicals, but it will help quantify the health risk to exposed individuals. LABAT-ANDERSON Incorporated will perform this toxicity/health risk assessment for some of the selected chemicals and submit the results and any conclusions/recommendations in a supplemental response to these comments.

3. ASBESTOS IN RAINFALL RUN-OFF

The Summary section of the EA (6.6.4) concludes that the short and long-term concentrations of released contaminants to the surface water pathway are equal. This conclusion is somewhat inconsistent with the Millington Site portion of the EA (6.2.2.2.2) which discusses the presence of asbestos fibers in site run-off (although no data is provided) and the engineering analysis portion of the RI (3.5) which discusses the instability of the current waste mound and its general lack of vegetation. This data would support a conclusion that the surface water run-off pathway may be a significant source of asbestos to the bordering river and potentially affects the short term concentrations of asbestos in the river water. This conclusion is stated in the conclusion section (7.0) of the RI.

LABAT-ANDERSON Incorporated considers that it is appropriate to model the surface water run-off pathway from the Millington Site in order to quantify its potential as a significant contribution to the asbestos content in the river. Preliminary results of rainfall run-off modeling predict that the run-off water from a storm event may result in the run-off water containing asbestos concentrations in the range of grams per liter. This would be diluted in the river with resultant asbestos concentrations about a factor of three higher than the US EPA Ambient Water Quality Criteria. As in the modeling done for the airborne asbestos there are some variables such as vegetative cover that when better estimates are known, more realistic values may be obtained.

The details of this run-off modeling are discussed in Appendix B to this report. LABAT-ANDERSON Incorporated will rerun this model after the site visit and submit the results with any conclusions/recommendations in a supplemental response to these comments.

THE FOLLOWING DETAILED TECHNICAL COMMENTS ARE PROVIDED FOR RESOLUTION IN THE FINAL VERSION OF THE RI

4. **Environmental monitoring data shows that cadmium is a prevalent contaminant in the water and soil media, and the data is basically consistent in magnitude for the various sites. However, one surface water sample adjacent to the Millington Site has an indicated cadmium concentration that is over an order of magnitude greater than any other waterborne cadmium concentration reported. Either this sample is inaccurate or there is another, undetected/undiscussed source of cadmium in the river water. This inconsistency is important since it is this value that is used (appropriately as a conservative value) to compare environmental monitoring/potential release concentrations for cadmium against appropriate limits. In the RI analysis it is concluded that the cadmium is the contaminant that is most likely to exceed its corresponding limits.**

Although the waterborne concentration of cadmium detected near the Millington site may have been as reported, the relative large amount of other environmental monitoring data does not support the reported cadmium level. Cadmium migration potential is much lower than most other metals as discussed in Movement of Selected Metals, Asbestos and Cyanide in Soil: Applications to Waste Disposal Problems, NTIS publication PB-266 905 dated April, 1977. Metals were detected in soil samples at concentrations commensurate with cadmium and it would be expected that the resultant waterborne concentrations of these other contaminants would also be commensurate with that detected for cadmium. However, this is not what the environmental monitoring data shows.

Since the RI contaminant exposure analysis does predict cadmium to be the most "limiting" contaminant with respect to its corresponding concentration limits, it is not appropriate to leave the inconsistent environmental monitoring data unexplained. Therefore, the RI should more completely discuss the exposure contribution and environmental behavior of the contaminant cadmium.

5. The EA analysis section for the surface water pathway at the Millington site (6.2.3.4) contains an error in the predicted concentration downstream of Bis (2-ethyl-hexyl) phthalate (DEHP). The dilution factor established for the Millington to Chatham portion of the river is approximately 0.53. This dilution factor is correctly applied to all of the other contaminants except DEHP where the downstream value has been reduced by a dilution factor of 0.06. There is no other discussion of this dilution difference in the RI. Therefore, this discrepancy should be corrected.

6. The three satellite sites all had environmental monitoring data which showed surface water asbestos concentrations in upstream samples equal to or greater than downstream samples. The RI proposes this phenomenon is due to some unknown source of asbestos contamination further upstream. Although this may be a valid conclusion, another possibility

which would also raise more concern for contaminant migration from the sites under study is backflow in the streams. The overall topography of the satellite sites is basically flat with a very shallow hydraulic head present over the specific waste site locations. Given these conditions it is not unreasonable to expect some local "ponding or backflow" of the surface water sources during certain periods. An example of such a time period may be during winter when ice formations affect local flow patterns of the surface water. If it is determined that this backflow effect may be occurring, it may be necessary to re-analyze the surface water run-off pathway for these sites.

Therefore, the RI should include an analysis of alternate explanations for the detection of asbestos at higher upstream than downstream concentrations and the potential pathways analyses impacts these alternatives may have.

7. The "filled pond area" of the New Vernon Road site received no quantitative analysis for its potential contribution to exposure pathways. It is the smallest single unit of the studied sites, and no environmental samples (soil, surface or ground-water) of this unit were obtained during the RI site work. However, the predicted ground-water flowpaths for this site show that surface water samples numbers 18 and 19 would be impacted by migration from the pond area and not the main landfill area.

   Therefore, the RI should address more completely the potential exposure pathways impacts from the "filled pond area" at the New Vernon Road site.

8. Section 3.9.3 of the RI discusses the general findings of the surface water sampling program. In two different sections the location of sample number SW-19 is discussed in order to explain the sample analysis results. However, the location cited for SW-19 by these two sections is confusing since it can be concluded that SW-19 was obtained at two different locations. Therefore, the RI should be

corrected to clarify the location of surface water sample number SW-19.

9. The predicted waterborne cadmium concentration in Table 6-17 of the RI is inconsistent with other sections of the RI that list this same predicted value. (For example Tables 6-23 and 6-27). Therefore, the RI should be corrected to resolve these data inconsistencies.

10. It is not clear from the explanation in Section 6.5.1.3 why benzene was chosen as an indicator chemical at the White Bridge Road site over chloroform. At this particular site, chloroform was more prevalent and present in higher concentrations in environmental monitoring samples than was benzene. When the two chemicals are ranked by the Indicator Scoring method of the Superfund Public Health Evaluation Manual, chloroform has a much higher relative score than does benzene for this site. The two chemicals also share similar chemical properties (e.g. vapor pressure, Henry's Law constant, etc.). Therefore, based on the data provided in the RI it is not clear why benzene should be chosen as an indicator chemical over chloroform at the White Bridge Road site. The RI should be corrected to explain more fully why the appropriate choice is benzene, or should include chloroform as an indicator chemical for this site.

APPENDIX A

PREDICTION OF AIRBORNE ASBESTOS FROM WIND EROSION

The following references will be used to model and predict the airborne asbestos concentrations at the sites of interest.

1. WIND EROSION FORCES IN THE UNITED STATES AND THEIR USE IN PREDICTING SOIL LOSS, Agriculture Handbook No. 346, U.S. Department of Agriculture, Agriculture Research Service, Washington, D.C., 1968.

2. HANDBOOK ON ATMOSPHERIC DIFFUSION, Hanna, S.R. et al, Office of Health and Environmental Research, U.S. Department of Energy, Report No. DOE/TIC-11223, 1982.

3. ASBESTIFORM FIBERS NON-OCCUPATIONAL HEALTH RISKS, Board on Toxicology and Environmental Health Hazards, Commission of Life Sciences, National Research Council, Library of Congress No. 84-60249, Washington, D.C., 1984.

A. STEP 1 - PREDICTION OF SOIL SURFACE EROSION BY WIND FORCES

The methodology of reference 1 is a generally accepted model for predicting the wind erosion of agricultural soils. The model is empirical and is based on a large amount of monitoring data. The model predicts the amount of annual soil loss per acre based on factors including soil type, vegetative cover, terrain characteristics, and geographic location.

This model will be applied to the New Vernon Road Site. This site is chosen since it is continuously occupied, has a relatively large landfill, and has asbestos containing materials on the ground surface.

The New Vernon Road Site is approximately a rectangle, 400 feet east to west and 300 feet north to south. It is essentially flat, and is assumed to be reasonably smooth in surface characteristics.

(All references to figures, tables, and diagrams are to those in reference 1)

(1) Figure 7 gives a value of K' = 0.5 for soil ridge roughness measurements of 2 to 6 inches. That is the soil surface varies by an average of 2 to 6 inches over the area of interest. K' is the soil ridge roughness factor.

(2) The RI describes the topsoil at this site as being a silty-clay matrix. The USDA textural classification guidelines would give the appropriate range of composition of sand in this soil of 0 to 20 percent. Sand typically ranges in size from 0.02 to 2 millimeters in diameter. The soil erodibility index, I', is based on the percent of particles equal or greater than 0.84 millimeters in diameter. Table 3 gives a range for I' for this soil of 98 to 180 with an average of 132.

(3) The following data table compiles many variables of interest necessary to complete this problem. These values are obtained from Table 1, figures 11 through 22, and figures 2 and 3.

C' = climatic factor (accounts for soil moisture)
A = angle of wind deviation from normal of north-south direction
R = wind preponderance factor
k = the k factor, is used to determine the relative distances traveled by the wind across the field of interest. Default values recommended for this variable are k50 values or the k value which results with 50 percent of the winds traveling greater than k50 times the width of the field in distance.

ASB 002 0782

MONTH

	J	F	M	A	M	J	J	A	S	O	N	D
A	22	23	22	22	22	21	45	45	68	23	23	22
R	1.2	1.6	1.4	1.2	1.2	1.2	1.4	1.1	1.4	1.2	1.5	1.4
k50	1.7	1.5	1.6	1.7	1.7	1.7	1.6	1.9	1.6	1.7	1.5	1.6
C'	5	5	5	7	2	2	2	2	2	2	5	5

(4) The relative distance traveled by the wind in the area of interest is k50 times the north-south width of the field. (300 feet)

(5) Determine the E2 factor which is I'K'.

High 90
Avg 66
Low 49

(6) Determine the E3 factor which is I'K'C'

High 630
Avg 242
Low 98

(7) Using the E2, E3 values, and figure 23 the value for E4 can be obtained. This is the value for soil loss in tons/acre/year for bare soil. (use the high, average and low values for D50)

E4 (tons/acre/year) = high 350
avg 190
low 70

(8) Use Figure 24 to take E4 and find the actual soil released based on vegetative cover. If it is assumed that a nominal cover of 6000

pounds per acre is present (a typical value for a marginally productive grain field) we get final erosion values of:

High 110 (tons/acre/year)
Avg 48
Low 6

(9) This model is designed to predict the annual loss of soil by erosion due to wind and therefore assuming that it is being emitted at a constant rate is not totally realistic. However, to apply the following part 2 diffusion model it will be necessary to have an emission rate for a shorter time period. Therefore, for purposes of this analysis a constant emission rate will be assumed.

conversion to necessary units:

110 tons	2.75 acre	2000 lb	.454 kg	year	day	hour
year acre		ton	lb	365 day	24 hour	3600 sec

resulting in 8.71 E-3 kg/sec or 31.36 kg/hr.

B. STEP 2 - DIFFUSION OF AIRBORNE DUST

The methodology of reference 2 is a generally accepted model for predicting the dispersion of an airborne contaminant with distance from the source. The model uses a gaussian type of approach to model the dispersion characteristics.

The RI report uses a relative stability class of B or slightly unstable for the areas under study. Therefore, calculations will be performed for both class B (slightly unstable flow) conditions and class D (slightly stable flow) conditions.

The basic equation is the following:

$$\frac{C}{Q} = \frac{1}{2\pi \sigma_y \sigma_z u} e^{-y^2/2\sigma_y^2} \times \left[e^{-(z-h)^2/2\sigma_z^2} + e^{-(z+h)^2/2\sigma_z^2}\right]$$

C = Contaminant concentration in milligrams per cubic meter

Q = source emission rate in milligrams per second

h = effective source height (meters)

v = wind velocity (meters per sec)

y = horizontal distance from plume axis

z = vertical distance of dose point (meters)

σ_y = standard deviation of mixing in the y direction as a function of dose point x distance from source

σ_z = standard deviation of mixing in the z direction as a function of dose point x distance from source

In this case the dose point will be assumed to be on the plume axis and therefore the first exponential term will be set equal to 1.0. The term σ_y was initially set equal to 25 meters to account for the area of the source.

A BASIC computer program with appropriate graphics commands was written to use the above equation and predict the effects of diffusion to the dose point at this site. In this case the dose point is approximately 200 meters from the center of the landfill area.

The predicted airborne dust concentration at the dose point for appropriate conditions,(see figures 1 and 2 for data output) is:

Class B stability, wind velocity 3 m/sec: 1.0 milligrams per cubic meter

Class E stability, wind velocity 2 m/sec: 7.6 milligrams per cubic meter

PUBLIC MEETING SUMMARY
ASBESTOS DUMP SITE
MILLINGTON, NEW JERSEY
POSSAIC TOWNSHIP HALL

AUGUST 20, 1986

Introduction

This summary describes a public meeting held at the Possaic Township Hall on August 20, 1986. The purpose of the meeting was to explain the nature of the site and the scope of remedial activities that will take place as outlined in the remedial investigation and feasibility study (RI/FS) work plan. The meeting was held expressly for the presentation of the work plan and was not included as part of the regular town council meeting.

Site History

The Asbestos Dump Site consists of one main site location and 3 other satellite areas, all within a 4-mile radius of the unincorporated town of Millington in Possaic Township, New Jersey. Asbestos shingles and roofing materials were manufactured by National Gypsum Company from 1953 to 1975 and disposed on an 11-acre tract of land along Division Street, which borders the Possaic River. Phenyl mercuric acetate, a paint solvent, was also disposed at this site. Other sites used solely for asbestos-contaminated waste disposal included a landfill which lies along a hiking trail in the Great Swamp National Wildlife Refuge and two privately owned properties located on 257 New Vernon Road and 651 White Bridge Road.

Operations began at the asbestos-shingle manufacturing plant, located in Millington, in 1927 and continued under several ownerships until 1975, when the plant closed permanently. Throughout a substantial part of its operating life, waste process water and some other materials from the plant were discarded on plant property near the Possaic River.

Specific areas which comprise the site were not identified until 1980. At that time, a former employee of one of the owners identified the three other areas that received solid waste asbestos material from the manufacturing plant. It is believed that discarded asbestos shingles were used as fill materials in these three areas.

The Millington area of the Asbestos Dump Site is within an industrial complex. The Great Swamp area is open to the public as a hiking and nature area. The other two areas privately owned.

are

Public Meeting Overview

Lillian Johnson, Superfund Community Relations Coordinator for EPA Region II, opened the meeting shortly after 8:00 p.m. After a brief explanation of the purpose of the meeting, Ms. Johnson introduced the persons who were in attendance for discussion concerning the Asbestos Dump Site:

- Raymond Basso -- Chief, New Jersey Investigation and Compliance Section, EPA
- Kevin Psarianos -- Project Manager, Asbestos Dump Site, New Jersey Department of Environmental Protection (NJDEP)
- Thomas Morahan -- Project Manager, Asbestos Dump Site, Fred C. Hart and Associates (Consultant to National Gypsum Company)
- Anthony Hoppa -- Community Relations Specialist, NUS Corporation (Consultant to the EPA)

After Ms. Johnson's introductory remarks, Mr. Basso provided a brief overview of the EPA's Superfund Enforcement process for remediation of hazardous waste sites in which the potentially responsible parties have been identified. The roles and responsibilities of the EPA, the National Gypsum Company, and the technical consultants for each were outlined and explained. Mr. Basso also highlighted the site, and subsequently, the enforcement history. He explained the purpose of the remedial investigation and the field activities that will be conducted during the study, including sampling procedures and locations. The purpose of the feasibility study was outlined and tentative project schedules and completion dates were discussed. At the conclusion of Mr. Basso's presentation, questions were received from those in attendance. Approximately 25 people attended this meeting.

The entire presentation, including questions and answers, lasted 1-1/2 hours. Mr. Basso answered most of the questions related to administrative and technical concerns, with assistance from Mr. Morahan and Mr. Psarianos on certain questions.

Fact sheets explaining the Superfund program and the public participation process were made available at the meeting room entrance. A sign-in sheet was also circulated so that interested citizens could be placed on the Asbestos Dump Site mailing list.

Primary Areas of Questioning

Nature and Extent of Contamination

Several questions were asked regarding the extent of the contamination, such as the discovery of the satellite sites--specifically, how the locations were determined; the record-keeping of National Gypsum's disposal practices; the possibility of additional sites containing paint solvents; and the Hazard Ranking Score for the site.

Mr. Basso and Mr. Psarianos explained that the satellite sites were located via aerial photographs and through informational interviews with people knowledgeable about the manufacturing operations of National Gypsum. Mr. Basso then explained the process by which sites become listed on the National Priorities List. Mr. Basso also explained that information request letters had been sent to National Gypsum in order to obtain more information on the company's disposal practices; however, he could not provide the details of the company's response to those letters but agreed to obtain the information and send it to the citizen who had questioned him. Mr. Basso stated that the EPA does not believe that paint solvents were disposed at the other sites. Also, he explained that while the exact score was not known, the site did score higher than 28.5 on the Hazard Ranking System to be included on the National Priorities List.

Administrative Concerns

Questions were asked about the cost of the remedial investigation; the relationship between the EPA and the NJDEP; the role of National Gypsum after the study is completed; and the remedial alternative screening criteria under the feasibility study, with specific reference to cost as a screening factor.

Mr. Morahan answered for Mr. Basso in regard to the cost question by explaining that National Gypsum would pay approximately $500,000 for the remedial investigation. Mr. Basso clarified the relationship between the EPA and the NJDEP, stating that although the EPA is the lead government agency, the NJDEP supplies them with their expertise and comments on all work plans and submittals by Fred C. Hart and Associates. He continued to explain that the NJDEP has review capacity and that all documents are submitted to the state for comment before being finalized. The role of National Gypsum after completion of the study was discussed by Mr. Basso, who, at this point, presented an overview of the enforcement process again. The screening criteria for remedial alternatives was highlighted, and Mr. Basso explained the concept of fund balancing--the EPA's method of distributing Superfund monies--and the variations of this policy for sites where the potentially responsible party has been identified.

Remedial Investigation Field Activities

Several questions were raised concerning the goal of the investigation and what type of information the EPA hopes to obtain; the use of groundwater monitoring wells; and the equipment and personnel that will be involved with onsite field activities.

Mr. Basso explained that the purpose of the RI is to collect data so as to better define and understand the problem. The purpose of the groundwater monitoring wells and the nature of the geology around the site vicinity was also discussed. Mr. Morahan highlighted the field activities that will take place and discussed the equipment that will be used during drilling operations and the people who will be working on site during these operations. Drilling schedules and locations were also given.

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Health Concerns

One question was raised concerning possible health effects from ingestion of well water that may be found to be contaminated with asbestos materials. Also, one citizen objected to the terminology used during the evening's discussion; she felt that gypsum, not asbestos, should be used to describe the contamination, as it is not pure asbestos that has been disposed at the sites, but rather, materials containing gypsum. She felt that the use of the word "asbestos" was creating an unnecessary fear.

Mr. Basso could not provide any information regarding the toxicity of asbestos but offered to send information to the individual after conferring with a employee of the Center for Disease Control. He did acknowledge that asbestos is more readily associated as an air problem, with health effects resulting from breathing asbestos fibers. Mr. Morahan and Mr. Basso also explained that a risk assessment would be conducted during the feasibility study to evaluate and measure the toxicity of asbestos and the threat to public health. It was reiterated that in order to arrive at any conclusions, data from the remedial investigation must first be collected and analyzed.

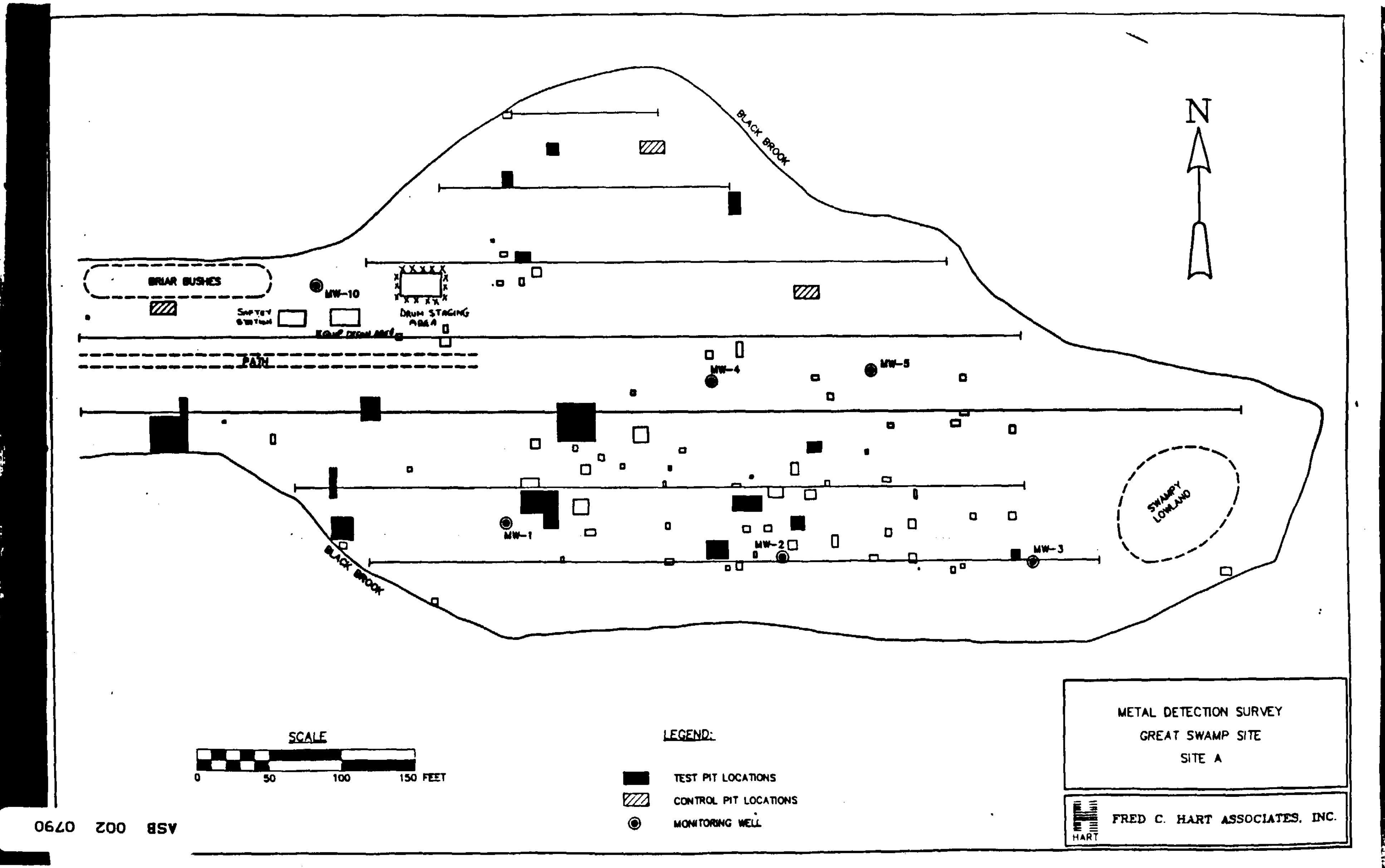
Public Participation Concerns

Questions were raised regarding the availability of information and also the procedures that would be followed if citizens volunteered information regarding other disposal areas.

Mr. Basso stated that all information that is not enforcement sensitive or confidential is available to the public. He also explained that while the EPA would follow up on any information regarding additional disposal areas, it would have to be determined at a later date whether the investigation of those sites would be included as part of this site's investigation or as a separate project.

<u>Brief Analysis of the Meeting</u>

EPA personnel were prepared for this meeting and answered questions in a clear manner. They were available after the meeting to discuss remaining concerns with the residents.



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BLACK BROOK
BRIAR BUSHES
MW-10
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MW-5
SWAMPY LOWLAND
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MW-2
MW-3
BLACK BROOK
SCALE
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LEGEND:
TEST PIT LOCATIONS
CONTROL PIT LOCATIONS
MONITORING WELL
METAL DETECTION SURVEY
GREAT SWAMP SITE
SITE A
HART
FRED C. HART ASSOCIATES, INC.

Asbestos Dump Meeting 1/27/87

Nigel Robinson	EPA	(212) 264-8678
Bill Colvin	Ebasco Services Inc.	(201) 460 6509
Steve Hambos	HART ASSOC. Inc	(212) 840-3990
Francie Barker	HART ASSOC.	(212) 840-3990
HARVEY K. McKENZIE	NJDEP/NJGS	(609) 292-0668
E.G Kaup	NJDEP/BECM	609-633-0701
Paul Devlin	NJDEP/BGWPM	609-292-0665

ASB 002 0791

(However, it should be noted that for the more quiescent conditions prescribed in Class E the emission rate would probably decrease greatly and this effect was not included)

C. STEP 3 - CONVERSION OF RESULTS TO ASBESTOS CONCENTRATIONS

Reference 3 contains information on asbestos from environmental and human health perspectives. A generally accepted conversion factor for asbestos is that there are approximately 30 fibers per nanogram of material. Therefore, from part B a resultant concentration of 1.0 milligrams per cubic meter of dust would result in an asbestos concentration of 0.01 milligrams per cubic meter assuming a 1 percent average asbestos concentration in the soil.

This airborne concentration of asbestos is approximately 0.3 fibers per cubic centimeter, which is approximately the level established for occupational exposure in eight hours (actual permissible exposure limit of 0.5 fibers per cubic centimeter).

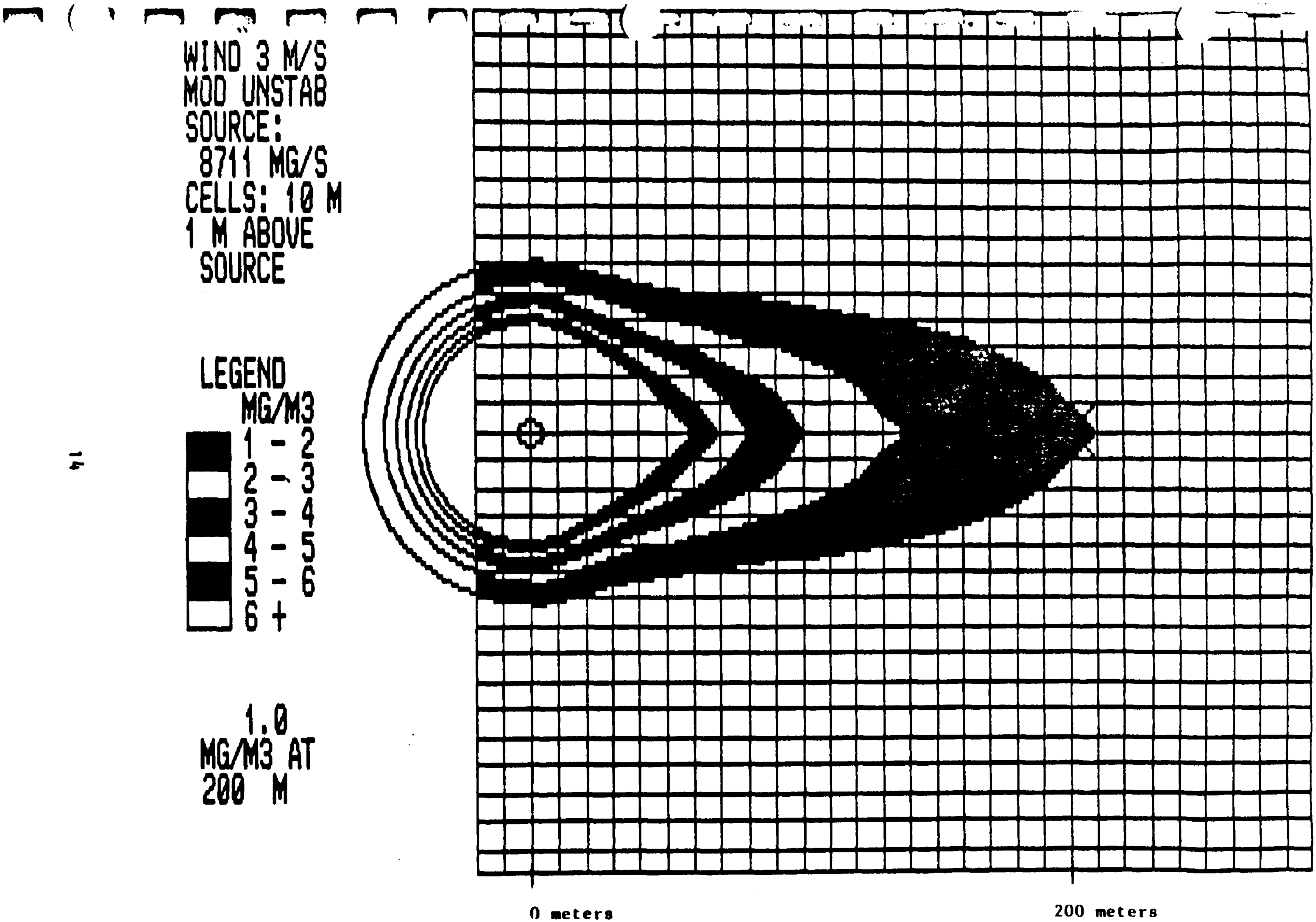

Figure 1 Plume dispersion for moderately unstable conditions

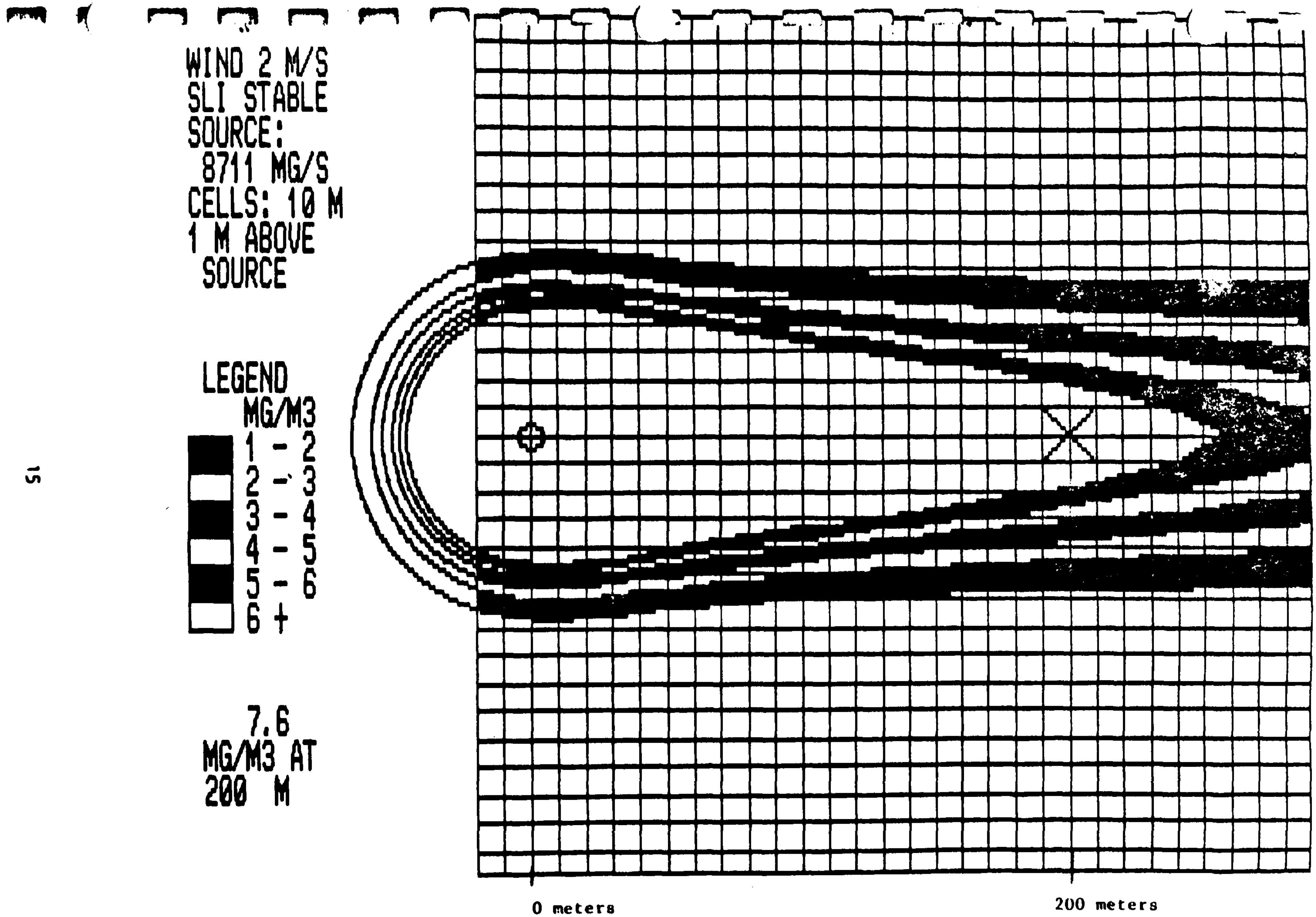

Figure 2 Plume dispersion for moderately stable conditions

APPENDIX B

PREDICTION OF POTENTIAL ASBESTOS CONCENTRATIONS IN SURFACE WATER

The potential for runoff of asbestos has been examined for the Millington site because of its proximity to the Passaic River and because its topography is conducive to erosion. Concentrations were calculated for asbestos in runoff at the edge of the asbestos disposal area and also after dilution in the Passaic River. Runoff of both sediment (erosion) and water were calculated using standard Soil Conservation Service (SCS) techniques.

Erosion was calculated using the Universal Soil Loss Equation (Wischmeier and Smith, 1978). This equation was designed to predict average soil loss in runoff for specific soil, topographic, and vegetation conditions. The equation is based on a large amount of research data and has a long history of use. The basic equation is as follows:

$$A = RKLSCP$$

where:

- A = the computed soil loss per unit area
- R = the rainfall and runoff factor
- K = the soil erodibility factor
- L = the slope length factor
- S = the slope steepness factor
- C = the cover and management factor, relating soil loss under specific vegetation and management conditions to continuous fallow
- P = the support practice factor, representing the effect of specific practices, for example, contouring, that may reduce erosion relative to cultivation up- and down-slope

The Soil Consevation Service has given ample guidance on the selection of numerical values for the various factors in the equation (Wischmeier and

Smith, 1978, and a variety of regional publications). An addition to the equation has been made to allow calculation of short-term runoff of asbestos-containing soil: Rainfall erosivity has been calculated on a single-storm basis using the method of Ateshian (1974).

The volumes of runoff water were calculated by means of the Soil Conservation Service runoff curve number technique (USDA, 1972). Runoff curve numbers describe the tendency for rainwater to run off the land. The runoff curve number was used in the following equations to predict runoff volumes:

$$S = (1000/CN) - 10$$

and

$$Q = (P - 0.2S)^2 / (P + 0.8S)$$

where:

CN = the runoff curve number
S = a retention parameter
P = the amount of rainfall (inches)
Q = the amount of runoff (inches)

The SCS National Engineering Handbook (USDA, 1972) provides guidance on the choice of runoff curve numbers. The handbook shows runoff curve numbers for various combinations of vegetation cover type and hydrologic soil group. All major soil series have been assigned by SCS to one of the four hydrologic soil groups, A through D. Soils suitable for growing crops are generally in the B or C groups. Soils in group A have an unusually low runoff potential, and soils in group D have an unusually high runoff potential.

The following assumptions were used to apply these equations to the Millington site:

- The degree of asbestos contamination in surface soil was not quantified in the RI report for any of the sites, so it was arbitrarily taken to be 1 percent. This may be an overestimate, but serious erosion or slumping of the steep banks along the river may expose more asbestos. The model predictions are directly related to the degree of asbestos contamination in surface soil, so they can easily be modified for other assumptions. For example, if the asbestos content of soil is actually 10 percent then the predictions for asbestos concentration in water presented below should be multiplied by 10.

- The rainfall erosivity factor was calculated for 24-hour rainfalls of 2 through 6 inches by one inch increments using an equation given by Ateshian. Rainfalls of 2 and 3 inches represent a degree of erosivity typical of storms with an expected return frequency of less than one year. A 6-inch rainfall represents a storm with a return frequency of about 10 years, based on statistics for Marlboro, New Jersey, presented by Wischmeier and Smith.

- The soil erodibility factor was estimated to be 0.3 based on the soil texture classification (silty-clay) given in the RI report, and using nomograms given by Wischmeier and Smith.

- A combined slope/length factor (LS) was calculated using a method developed by Foster and Wischmeier (Warrington et al., 1978) for segmented slopes. Assuming an upper segment 300 feet long with an average slope of 4 percent and a lower segment of 150 feet with an average slope of 14 percent the LS factor was estimated to be 2.61.

- The cover factor was assumed to be 0.20, based on the estimate for a 20 percent grass cover given by Wischmeier and Smith.

- The erosion control practice factor P was taken to be one, indicating the lack of special practices or structures.

- The hydrologic soil group was assumed to be C, which is typical of fine-textured soils.

- The runoff curve number was taken to be 79, based on pastureland in fair condition with hydrologic soil group C.

- Each mg of asbestos was assumed to correspond to 30,000 fibers.

- The flow in the Passaic River was taken to be 135 cfs, which is 1.5 times the long-term average flow. This flow estimate will be revised based on data from the US Geological Survey.

The predictions of the runoff modeling are given in Table B-1.

Table B-1. Runoff Calculations for the Millington Site.

Rainfall (inches)	Soil Loss (tons/ha)	Runoff (inches)	R	Asbestos Runoff (kg)	Asbestos in Passaic (mg/L)	(fibers/L)
2	3.88	0.52	10.0	100	0.305	9,100
3	9.47	1.19	24.5	247	0.746	22,400
4	17.82	1.96	46.1	464	1.40	42,000
5	29.10	2.80	75.3	758	2.29	68,700
6	43.50	3.68	112.4	1,130	3.41	102,000

References Cited in Appendix B

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